

## **SPECIFICATION**

### **TITLE**

**“DEVICE FOR EXTRACTING PROCESSING RESIDUES”**

### **BACKGROUND OF THE INVENTION**

The invention is directed to a device and method for extracting processing residues for a processing apparatus having a plurality of processing units that are preferably movable along a processing path, particularly for an engraving machine having a plurality of engraving supports, whereby an admission opening of an extraction conduit is allocated to each processing unit.

Given a processing apparatus of the above type, particularly given engraving machines for example, for engraving printing form cylinders for rotogravure, it is standard to connect each processing unit to a type of vacuum cleaner via an extraction conduit, normally an extraction hose, in order to extract processing residues, for example dust or gasses, from the work region. It is space-wasting and involved to conduct these extraction conduits in cable chains or the like, particularly when the processing units are movable along a processing path. Moreover, such long extraction conduits are then needed that only about half of the cleaning power of the vacuum cleaner may take effect at the extraction side of the extraction conduits under certain circumstances.

### **SUMMARY OF THE INVENTION**

It is an object of the invention to improve a device of the type initially cited, particularly designing it to be more economical and stringent.

According to the present invention, a collecting main for the extraction is provided.

A collecting main is provided so that the air management can advantageously occur in bundled or concentrated fashion and, for example, can also be arranged centrally and in space-saving fashion or space-beneficially. As a result thereof, moreover, a maximum cleaning power can also be utilized since the collecting main can comprise a liberally dimensioned cross-section that can be connected to a vacuum cleaner, so that a correspondingly good flow is assured.

A next development of the invention provides that the collecting main is designed as an extraction channel, and that end of each of the extraction conduits facing away from the processing unit comprises a mouthpiece or snout that discharges into the extraction channel.

Such an extraction channel can be centrally and space-beneficially arranged and lay, and accesses thereto in the form of the mouthpieces or snouts can also be arranged positionally suited for the extraction conduits. A new, additional connection or a replacement of parts is also advantageously possible given the arrangement of the invention.

Moreover, the mouthpieces can be moved along the extraction channel. The mouthpieces can then replicate a movement of the processing units, particularly of engraving supports of an engraving machine, so that connecting extraction hoses between a mouthpiece and a processing unit need not be readjusted onto curved paths but can form an essentially straight line, direct and

relatively short connection, which is beneficial for the design of the device and its effective cleaning power.

For that purpose, for example, each mouthpiece can discharge into an admission slot or gap of the extraction channel and be movable along this admission slot.

Elastic seal lips, as provided in a preferred embodiment of the invention, can close the admission slot, so that, despite said mobility, the admission slot is essentially always closed over its length in order to avoid bleed air. Only the mouthpieces then respectively project between the seal lips for opening the seal lips. This opening region of the seal lips at the mouthpieces migrates with the mouthpieces given movement of the latter. The seal lips remain closed preceding the respective mouthpiece in moving direction, and, due to their elasticity, the seal lips in turn close automatically behind the mouthpiece. The closing of the seal lips can be supported by a closure element that leads and/or trails the respective mouthpiece. Roller elements that roll along the seal lips can be provided therefore.

The spreading and opening of the seal lips given a movement of the mouthpiece can be promoted by the shaping of the mouthpiece in that, for example, the mouthpiece comprises spurs that point in the possible motion direction. Such a spur can, in particular, be essentially wedge-shaped, so that the cross-section of the mouthpiece is shaped roughly like, for example, a small boat.

In a further development of the invention that the processing units are movable along a carrier, and that the collecting main is arranged at or in this carrier, as well as centrally, protected, and close to the moving processing units, designed, for example, as an extraction channel integrated in a hollow carrier profile.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

Figure 1 is a cross-section of an equipped engraving machine according to the invention for engraving rotogravure form cylinders;

Figure 2 is a plan view onto the engraving machine of Figure 1;

Figure 3 is a magnified detail from the cross-section of Figure 1;

Figure 4 is a cross-section of a mouthpiece entering between seal lips, shown from above;

Figure 5 is a section of the mouthpiece and its surroundings according to Figure 4, shown in a side view; and

Figure 6 shows the section of the mouthpiece according to Figure 5 in end view.

### **DESCRIPTION OF THE PREFERRED EMBODIMENTS**

For the purposes of promoting an understanding of the principles of the invention, reference will now be made to the preferred embodiment illustrated in the drawings and specific language will be used to describe the same. It will nevertheless be understood that no limitation of the scope of the invention is thereby intended, such alterations and further modifications in the illustrated device, and such further applications of the principles of the

invention as illustrated therein being contemplated as would normally occur to one skilled in the art to which the invention relates.

Figure 1 shows a cross-section of an engraving machine for engraving rotogravure form cylinders 1a, 1b that is equipped according to the invention with a central extraction channel 2 parallel to the printing form cylinders.

The engraving machine comprises engraving supports 3, 3' (only schematically indicated) that are displaceable into the plane of the drawing and out of the plane of the drawing along the printing form cylinders 1a, 1b on rails 6 on a carrier 4 in which the extraction channel 2 is integrated and that can be positioned at the printing form cylinders 1a, 1b in the direction of a double arrow 5, being positioned together with the carrier on rails 7. Printing form cylinders 1a, 1b that are possible as an alternative and have exemplary, different diameters are shown, as are two corresponding positions 3, 3' of the engraving supports.

The carrier 4 and the printing form cylinders 1a, 1b are seated on a machine undercarriage 8, whereby the printing form cylinders 1a, 1b are also arranged displaceable on rails 9 in their axial direction.

It can also be derived from Figure 1 that the upper side of the extraction channel comprises an admission slot 10 that precedes over its length and that is closed with seal lips 11 between which mouthpieces penetrate and project into the extraction channel.

Figure 2 shows a plan view onto the engraving machine of Figure 1 in a form that is more simplified and schematic for the sake of clarity. Identical

components in Figure 2 are referenced with the same reference characters as in Figure 1.

Proceeding beyond Figure 1, Figure 2 indicates mouthpieces 12, particularly at two of the engraving supports 3 arranged along the printing form cylinder 1a, 1b, that project between the seal lips 11 into the admission slot 10 of the extraction channel and thereby spread the seal lips 11 apart. As the engraving supports move on the carrier 4 along the printing form cylinder 1a or 1b, the mouthpieces 12 shift in the admission slot 10 in the same longitudinal direction.

Figure 3 shows a magnified detail from Figure 1 wherein the same components are again referenced with the same reference numerals as in the preceding Figures.

In particular, the region of a mouthpiece 12 projecting into the extraction channel 2 can be seen in greater detail and more exactly in Figure 3. A connecting hose 13 between an engraving support 3 and the mouthpiece 12 is indicated, again only schematically and fundamentally. The connecting hose 13 has its admission opening 14 in the region of the engraving support in the proximity of the region of the printing form cylinder 1a or 1b to be processed, and from which it extracts residues of any and all types that arise during engraving, i.e. particularly dust and gasses, in the direction of the arrow 15 through the mouthpiece 12 into the central extraction channel, which is uniformly accessible to all engraving supports via relatively short and direct connecting hoses 13. The extraction channel 2 itself can have one of its end faces connected to a hose

with a relatively large cross-section that leads to a blower device or the like.

First in cross-section, then in a side view, and then in an end view, Figures 4 through 6 show a region of a mouthpiece 12 in its surroundings and in a view that is magnified further compared to the illustration of Figure 3.

Figure 4 shows how the seal lips 11 close the admission slot 10 of the extraction channel 2 situated therebelow but are spread apart by the mouthpiece 12. For improving the spreading event, the mouthpiece is designed roughly boat-shaped in cross-section with essentially wedge-shaped spurs 16. Moreover, roller elements 17 with the axis lines 18 are indicated that serve as closure elements for holding or pressing the seal lips 11 together in front of and behind the mouthpiece 12.

The arching of the seal lips 11 when they are spread apart and the closure function of the roller elements 17 can be clearly seen in Figure 5.

The closure function of the roller elements 17 can be seen even more clearly in the end view of Figure 6.

While the invention has been illustrated and described in detail in the drawings and foregoing description, the same is to be considered as illustrative and not restrictive in character, it being understood that only the preferred embodiment has been shown and described and that all changes and modifications that come within the spirit of the invention are desired to be protected.